



OFFICE OF
RIVER PROTECTION
United States Department of Energy

Hanford Tank Waste Strategy

Test Bed Initiative-Phase II

For Hanford Advisory Board

Tank Waste Committee

January 9, 2019



- Continues the small-scale demonstration for supplemental Low Activity Waste (LAW) treatment and off-site disposition
- Builds on success of recent 3-gallon effort to conduct a 2,000-gallon test
- Uses existing technology and off-site commercial facilities to remove waste from Hanford
- Regulatory and technical processes will provide valuable opportunity for joint U.S. Department of Energy (DOE) and State of Washington Department of Ecology (Ecology) lessons learned
- Lessons learned will support future consideration to expand the demonstration

- Maintain DOE focus on Direct Feed Low Activity Waste (DFLAW) delivery
- Continue/enhance collaboration with Ecology to develop and execute successful permitting strategies
- Conduct the demonstration in fiscal year (FY) 2019
- Confirm anticipated benefits:
 - Permanent removal of waste from Hanford
 - Create double-shell tank (DST) space
 - Demonstrate a waste removal approach in areas of limited existing infrastructure
 - Inform possibility for expansion beyond 2,000 gallons



- Extract liquid material from tank
- Pretreat liquid using filter and ion exchange
- Sample and complete Waste Incidental to Reprocessing (WIR) evaluation process to determine if liquid can be managed as Mixed Low-Level Waste (MLLW)
- Transport waste to off-site treatment facility
- Stabilize waste using grouting process
- Transport solid, stabilized MLLW to Waste Control Specialists (WCS) Federal Waste Facility in Andrews, TX for disposal

In-Tank Waste Retrieval and Pretreatment - Design Concept

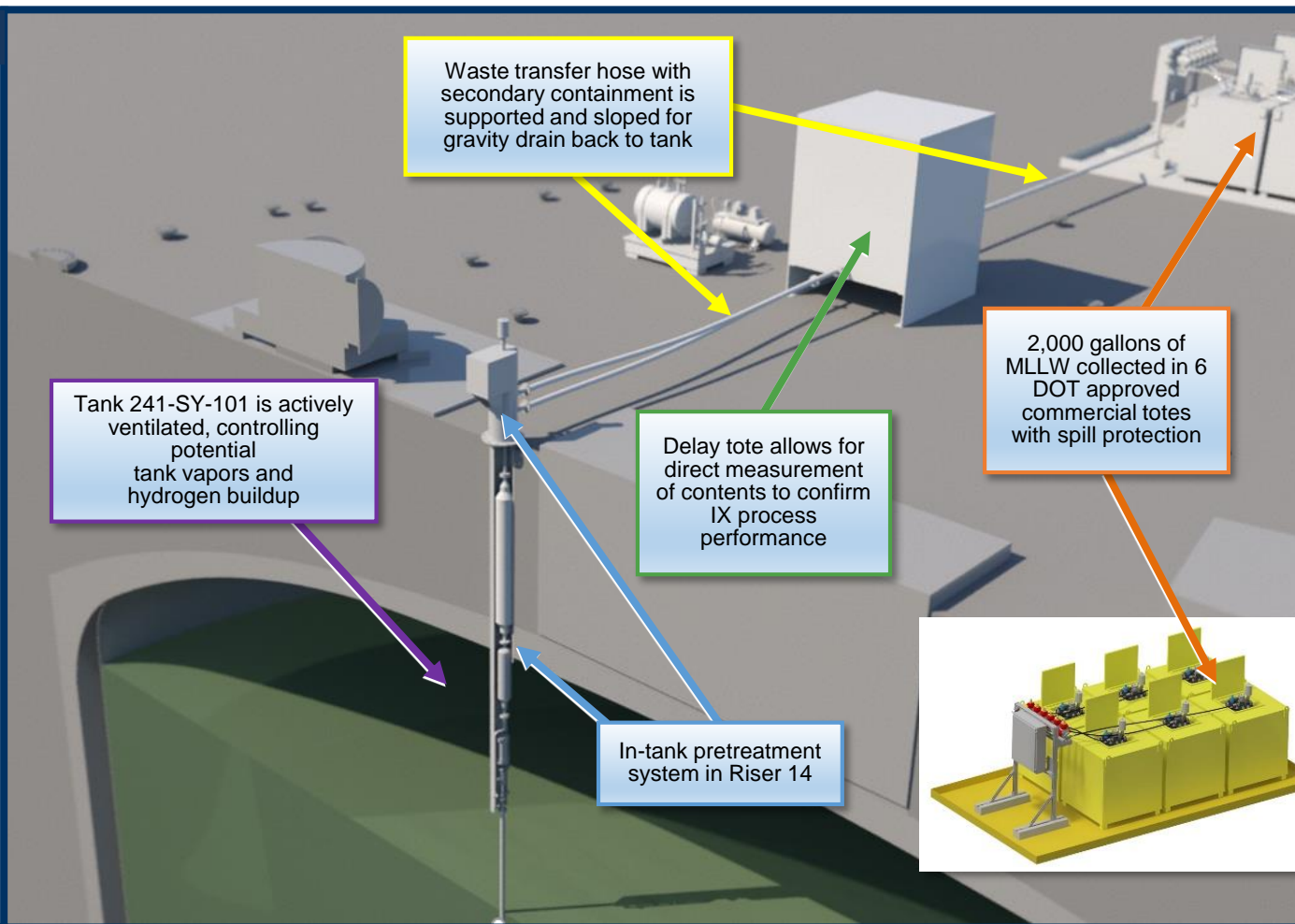
- Simple in-riser concept limits cost and simplifies safety basis evaluations
- Employs proven technical approach/maximizes use of existing infrastructure and off-the-shelf components
- Removes solids and Cs-137 to support WIR determination as MLLW
- Mitigates possible failure modes through simple design solutions (leaks, pressurization, maintenance, plugging, etc.)
- Utilizes existing 12-inch riser
- Provides additional shielding on tank components (hose barns, hose cover plates)

Test Bed Initiative Phase II In-Tank Pretreatment System

Tank 241-SY-101 Field Deployment Concept

Key Milestones

- Complete TBI 60% Design
- Complete TBI 90% Design
- Complete TBI Final Design
- Complete receipt of Ion Exchange System and Equipment
- Complete Installation of the TBI system
- Issue Declaration Of Readiness
- Complete the treatment of 2,000 gallons
- Ship Waste To Perma-Fix
- Complete TBI Phase 2



- Source Tank Objectives:
 - No interference with DFLAW
 - Minimal infrastructure needs
 - Chemistry/curie content applicable to planned technical approach
- Selected Tank: SY-101
 - Away from ongoing operations
 - Actively ventilated
 - Ample supernate/target contents
 - Creates needed tank space for 222-S Laboratory waste

- Working with Ecology on permitting approach for the 2,000-gallon test
- Progress the development of the technical approach to support the schedule objective of FY2019 for test completion

- DFLAW delivery remains the focus and top priority for DOE
- Test Bed Initiative Phase II provides near-term opportunity to evaluate additional pathway to move the tank waste mission forward
- DOE is working collaboratively with Ecology to:
 - Conduct the second phase of the demonstration
 - Assess the results and consider options for follow-on opportunities to further reduce risk by removing tank waste from Hanford